**Damage model for monotonic and fatigue response of high strength concrete**

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**Abstract:** An anisotropic elasto-damage model for predicting the response of concrete subject to monotonic and fatigue loading is presented in this study. The model utilizes a concrete appropriate damage-effect tensor M in constructing the constitutive equations. The concept of multiple bounding surfaces is used, with a varying size limit fracture surface defining fatigue loading in contrast to a fixed size limit fracture surface for monotonic loading. The model after calibration is shown to predict the monotonic, compressive uniaxial stress-strain path for concretes of various strengths as well as S-N curves depicting the fatigue response of concrete.